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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,631	09/06/2000	Marilynn E. Etzler	23070-079820US	1727

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[REDACTED] EXAMINER

BAUM, STUART F

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

1638

DATE MAILED: 01/15/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/657,631	ETZLER ET AL.
	Examiner	Art Unit
	Stuart F. Baum	1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 October 2002.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,4,5,9,11,13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,4,5,9,11,13 and 14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

1. The amendment filed 10/22/02 has been entered.

Claims 1, 4-5, 9, 11, and 13-14 are pending.

Claims 2, 3, 6-8, 10, and 12 have been canceled.

Claims 1 and 11 have been amended.

2. Rejections and objections not set forth below are withdrawn.

3. The text of those sections of Title 35, U.S. Code not included in this office action can be found in a prior office action.

4. Claims 1, 5, 9, and 11, 13-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is maintained for the reasons of record set forth in the Official action mailed 7/17/02. Applicant's arguments have been fully considered but they are not persuasive.

The Applicants contend that the Written Description rejection must fail because Applicants disclose isolating LNP proteins using degenerate primers to conserved sequences of *Dochilos biflorus* and they have presented a representative number of LNP sequences showing conserved domains as presented in U.S. Patent No. 6,465,716 which Applicants have incorporated by reference. Applicants continue by reciting Roberts et al, wherein the authors discuss the relationship and common structural features of the *Dolichos*, *Medicago* and *Lotus*

LNP genes. Applicants also disclose carbohydrate binding activity which is a characteristic feature of LNPs of the present invention which is disclosed in U.S. Patent No. 6,465,716.

The Examiner agrees that the presented reference, U.S. Patent No. 6,465,716, discloses an assay for detecting carbohydrate binding activity of LNP proteins of the present invention (U.S. Patent No. 6,465,716, column 15, Example 1) and it teaches the isolation of *Lotus* and *Medicago* LNP proteins (column 22, Example 2). But, the specified patent does not disclose the four motifs that are conserved among apyrase proteins. It is written in the patent (column 16, lines 57-59) that the conserved motifs are designated by the boxes in SEQ ID NO:2, but the Examiner could not locate this information anywhere in the patent. Also, the sequence alignments and boxed regions designating the conserved domains needs to be written in the specification of the present application. Therefore, Applicants have not supplied sufficient information in the body of the specification which permits claims drawn to 70% sequence identity to SEQ ID NO:10. Limiting the claims to just the recited SEQ ID NO:10 will over-come this rejection.

5. Claims 1, 5, 9, 11, and 13-14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited a method of decreasing the mycorrhizal infection of *Lotus japonicus* by *Glomus intraradices* comprising transforming *L. japonicus* with a construct comprising the *L. japonicus* lectin nucleotide phosphohydrolase (LNP) in antisense orientation operably linked to the CaMV 35S promoter and terminator does not reasonably provide enablement for claims broadly drawn to a method of modulating mycorrhizal infection in any plant comprising transforming any plant with any LNP polynucleotide wherein the LNP

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polynucleotide encodes an LNP polypeptide at least about 70% identical to SEQ ID NO:10 all of which are in sense orientation operably linked to any LNP promoter for the purpose of enhancing expression of the LNP polynucleotide thereby increasing infection of the plant by any mycorrhizal fungus. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. This rejection is maintained for the reasons of record set forth in the Official action mailed 7/17/02. Applicant's arguments have been fully considered but they are not persuasive.

The Applicants contend that the specification contains ample information to practice the claimed invention and references information within the specification and for information regarding "assays for activity" can be found within U.S. Patent No. 6,465,716. Applicants assert that LNP proteins comprise four conserved structural motifs characteristic of apyrase enzymes and they continue by stating that these regions are sensitive to modification. The Applicants further contend that guidance is provided that enables one skilled in the art to assay carbohydrate binding and apyrase activity and references U.S. Patent No. 6,465,716. Applicants contend that the "assays can be used alone or in combination to distinguish LNPs from among those proteins with 70% homology to SEQ ID NO:10" (sentence bridging page 7-8). Applicants also contend that LNP proteins can be used to promote mycorrhizal infection in plants. Applicants cite the experiments in which antisense expression was used to eliminate mycorrhizal infection. Applicants cite Albrecht et al (Exhibit 2) that teach mycorrhizal and Rhizobium symbioses use the same gene products to establish the respective symbioses. In conclusion, Applicants cite

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Roberts et al who “suggest that LNP may play a role in the initiation of rhizobium-legume symbiosis” (sentence bridging page 8-9).

The Examiner agrees that the assay disclosed in U.S. Patent No. 6,465,716 would permit one skilled in the art to assay a protein for phosphohydrolase acitivity associated with apyrase enzymes. And the Examiner agrees that the four conserved domains characteristic of apyrase enzymes are most likely sensitive to modification. But, Applicant has not taught that the specified regions are sufficient for the proper activity of apyrase enzymes involved in mycorrhizal infection. Applicant has shown that these regions are characteristic of apyrase enzymes, but not all apyrase enzymes have the same activity as SEQ ID NO:10. Applicants have not taught what regions are important for the specific activity of SEQ ID NO:10. Applicants have shown that they can reduce mycorrhizal infection by using antisense constructs of *Lotus japonicus* LNP. This demonstrates that the LNP enzyme is required for infection, but it does not show that LNP is sufficient by itself to increase mycorrhizal infection. Even though the Albrecht et al reference teaches that the pathways leading to mycorrhizal and Rhizobium infection utilize the same genetic pathways, Applicants have not demonstrated that their invention is sufficient to increase infection when overexpressed by itself in a plant. There are examples in which overexpressing a protein does not produce the inverse phenotype of the mutant gene.

6. No claims are allowed.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

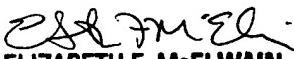
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stuart Baum whose telephone number is (703) 305-6997. The examiner can normally be reached on Monday-Friday 8:30AM – 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3014 or (703) 305-3014 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the legal analyst, Tiffany Tabb, whose telephone number is (703) 605-1238.

Stuart F. Baum Ph.D.

January 8, 2003


ELIZABETH F. McELWAIN
PRIMARY EXAMINER
GROUP 1600